Resource Recovery

STANDARDS DEVELOPMENT BRANCH OMOE
3693600004390

MARKET ANALYSIS

PROPOSED RESOURCE RECOVERY PLANT

REGIONAL MUNICIPALITY OF HALTON

TECHNOLOGY AND MARKET DEVELOPMENT

RESOURCE RECOVERY BRANCH

Ministry of the Environment

SEPTEMBER, 1977

TD
794.5 O
.P75
1977
MOE

TD
794.5
.P75
1977

Market analysis : proposed
resource recovery plant
regional municipality of Halton /
Provias, P. J.

76778

Copyright Provisions and Restrictions on Copying:

This Ontario Ministry of the Environment work is protected by Crown copyright (unless otherwise indicated), which is held by the Queen's Printer for Ontario. It may be reproduced for non-commercial purposes if credit is given and Crown copyright is acknowledged.

It may not be reproduced, in all or in part, part, for any commercial purpose except under a licence from the Queen's Printer for Ontario.

For information on reproducing Government of Ontario works, please contact Service Ontario Publications at copyright@ontario.ca

MARKET ANALYSIS

Proposed Resource Recovery Plant

Regional Municipality of Halton

By: P. J. Provias, P. Eng.

Ontario Ministry of the Environment
Resource Recovery Branch
Technology and Market Development Section

September, 1977

TABLE OF CONTENTS

	Page No.
LIST OF TABLES	iii
SUMMARY	iv
INTRODUCTION	1
BACKGROUND	2
METHODOLOGY	3
COMMODITIES AND MARKET POTENTIAL	6
Shredded Air Classified Mixed Paper Fraction	6
Background	6
Energy Markets - Cement	11
Cellulose Insulation Market	19
Construction Materials Market	23
Sludge Dewatering	25
Shredded Ferrous Fraction	27
Background	27
De-tinning Industry Market	30
Ferrous Scrap Dealers	32
Alternate Markets	34
Values	42
Corrugated Cardboard - Used News	45
Markets	45
Values	50

TABLE OF CONTENTS - continued

	Page No.
Other Commodities	50
DISCUSSION	53
Marketing of Secondary Materials	53
Interaction with the Ministry's Experimental Plant for Resource Recovery	57
CONCLUSIONS	59
REFERENCES	62
APPENDICES	63
EXHIBITS	72

LIST OF TABLES

		Page No.
TABLE I:	WASTE AVAILABILITY 1980 - 1990	6
TABLE II:	REFUSE DERIVED FUEL REVENUES - ST. LAWRENCE CEMENT CO.	15
TABLE III:	POTENTIAL REVENUES FROM CELLULOSE FIBRE INDUSTRY	22
TABLE IV:	PROJECTED REVENUES FROM CONSTRUCTION MATERIALS MARKET	25
TABLE V:	ESTIMATED FERROUS MATERIAL RECOVERY	27
TABLE VI:	DE-TINNING INDUSTRY - REVENUES	32
TABLE VII:	ESTIMATED WASTE PAPER RECOVERY	45
TABLE VIII:	ESTIMATED REVENUES FROM CORRUGATED AND WASTE NEWS	51
TABLE IX:	REVENUES FROM A 'FRONT-END' RESOURCE RECOVERY PLANT	60

SUMMARY

A study of the existing and potential markets for materials produced from a prospective resource recovery facility serving the Regional Municipality of Halton has been conducted. This study was carried out at the request of the Regional Municipality of Halton and also in response to a recommendation of a preliminary plant engineering study, conducted for the Ministry by M. M. Dillon Limited. Since markets for steam produced directly from refuse were not promising, consequently, the marketing study was confined to four major commodities: refuse derived fuel (RDF), ferrous material, waste news, and corrugated cardboard. These products would be available from a processing facility featuring shredding, magnetic separation and air classification.

In a facility of this nature, the refuse derived fuel or RDF (air classified mixed paper fraction) is expected to represent approximately 50 percent by weight of the processable solid waste. This fraction has been shown to be a viable source of energy with the potential of supplementing fossil fuels used widely throughout industry. The most promising long-term market for Halton RDF is the energy-intensive cement industry and specifically the St. Lawrence Cement Company in the adjacent Municipality of Mississauga. Within this company, a 30 percent fossil fuel replacement by the refuse

derived fuel would utilize all of the RDF from the proposed facility; full scale studies by the Ministry of the Environment in conjunction with Canada Cement Lafarge Ltd., Woodstock are being undertaken to assess the feasibility of utilization of this material within the cement industry.

The magnetically separated ferrous fraction is estimated to be 5 percent by weight of the processable solid waste, and consists primarily of 'tin cans'. Numerous markets for this material have been identified and these markets will be able to absorb the projected 1990 output of ferrous material from the facility.

Two additional products, waste news and corrugated cardboard, have high potential for recovery prior to processing and firm markets for these materials are identified. Recovery and marketing of other components of refuse, such as glass, rubber, and non-ferrous metals, will likely be contingent upon further developmental work being carried out at the Ministry of the Environment's Experimental Plant for Resource Recovery.

Specific revenue projections have been made assuming the recovery and marketing of four major products: refuse derived fuel (RDF), ferrous material, waste news, and corrugated cardboard. These projections indicate that net revenues from recovered materials (not taking into consideration plant amortization and operating costs) are expected to be $8.30/ton of waste processed in 1980, $12.00/ton processed in 1985, and $17.00/ton processed by 1990.

INTRODUCTION

In order to consider the viability of any resource recovery facility, detailed information on markets, market potential and revenues for recovered materials must be determined.

The Resource Recovery Branch of the Ontario Ministry of the Environment has conducted such a review of the present and potential markets for the commodities that would be produced at the proposed resource recovery plant located in the Regional Municipality of Halton.

Products, in order to be marketable, must be economically produced and delivered at consistent, stated quantities, within industry specifications, thus providing the user with a material suited to his needs.

Emphasis has been placed on market development for the following separated commodities:

- shredded air classified paper fraction,
- ferrous fraction,
- corrugated cardboard,
- newspaper.

Although the Regional Municipality of Halton was considered as the initial market area, consideration was also given to peripheral areas in order to develop as many potential users as possible for the recovered products.

The study was carried out in response to a request[1] from the Regional Municipality of Halton, dated September 20, 1976,

in which the Region asked that the Ministry of the Environment actively pursue long-term viable markets for the recovery of metal and refuse derived fuel (RDF).

BACKGROUND

The Ontario Ministry of the Environment has had underway, since 1974, a staged programme on solid waste management with the mandate to reduce, primarily through resource recovery, the large and growing volume of municipal wastes being landfilled.

The Provincial Resource Recovery Programme initially planned for the construction of six regional resource recovery plants, one of which was to serve the Regional Municipality of Halton. In this context, the consulting firm, M. M. Dillon, was commissioned to do the Waste Management and Pre-Engineering Study for Halton and provide recommendations for future action.

In their report[(2)], tabled before the Region July 26, 1976, one of the recommendations made by Dillon was that:

> "The Regional Municipality should actively pursue with the MOE the establishment of long-term viable markets for recovered ferrous material and refuse derived fuel

> (RDF)* and that the Region request the MOE to establish a resource recovery plant to separate, as usable commodities, the ferrous fraction and shredded paper fraction".

In response to the Region's request of September 20, 1976, the Minister of the Environment, the Honourable G. A. Kerr, replied[3] on October 3, 1976, stating, among other things, that:

> "the first step would be to enter into a Provincial/Municipal agreement in principle to proceed on these lines conditional upon the future development of the necessary markets".

METHODOLOGY

Although market development per se has not been a priority with current municipal resource recovery systems, nevertheless, a review of some of these systems[4, 5] has demonstrated the viability of both material and energy recovery. In addition, dialogue has been established with both public and private sector agencies for exchange of information and ideas.

---

* "refuse derived fuel (RDF)" and "air separated shredded mixed paper fraction" are synonymous with one another

Active liaison has been established with Provincial and Federal agencies concerned with solid waste management. The Department of Industry, Trade and Commerce; National Research Council; and Energy, Mines and Resources are Federal Departments which are not only aware of our programme but are also providing statistical input on the movement of raw and processed materials as well as providing results of support research work in certain areas related to the upgrading of secondary recovered materials to an improved marketable grade.

The review of published literature on resource recovery systems has provided specific information on marketing data. Although this material is predominantly American, it has certain connotations to the Ontario situation. American liaison has been quite extensive with active dealings with such groups as:

- National Centre for Resource Recovery (NCRR), Washington, D.C.,
- Midwest Research Institute, Kansas City, Missouri,
- U.S. Bureau of Mines, College Park, Maryland,
- American Institute of Iron and Steel - Tin Plate Division, Washington, D.C.,
- National Association of Recycling Industries (NARI), Washington, D.C.,
- Environmental Protection Agency (EPA), Washington, D.C.,

- Energy Research and Development Agency (ERDA), Washington, D.C.,

as well as municipalities actually involved with resource recovery. These sources will continue to be useful in the market development efforts of the Ministry's Resource Recovery Programme.

Certain assumptions were made regarding the separable commodities from the front-end resource recovery plant.

For instance:

a) the shredded air classified mixed paper fraction, without additional processing will be used initially as a source of energy (RDF),

b) the magnetically separated ferrous shredded fraction is being offered initially to the market place without additional processing, but for maximum market penetration and flexibility, consideration will also be given to the additional process of densification by either 'baling' or 'nuggetizing' the material,

c) the manually separated clean corrugated cardboard and bundled newspapers will be marketed as such to the appropriate outlets.

In assessing the viability of identified users of recovered commodities in the market place, the following factors have been taken into consideration:

- integrity of the user,

- usage capability,
- demand requirements,
- competitive prices of comparable primary commodities,
- interest and public profile of the user.

COMMODITIES AND MARKET POTENTIAL

SHREDDED AIR CLASSIFIED MIXED PAPER FRACTION

Background

When separated, this commodity will be nominally 50 percent by weight of the ingoing processable municipal solid waste so that a 1000 ton/day plant will produce, on one shift, 500 ton/day, 2500 ton/week or 125 000 ton/year of this material.

Processable solid waste available to the Halton Plant is outlined in the following table[6]:

TABLE I

WASTE AVAILABILITY 1980 - 1990

Year	Processable Waste		Shredded Mixed Paper Fraction	
	ton/day	ton/year	ton/day	ton/year
1980	673	168 354	336	84 000
1985	842	210 597	421	105 200
1990	1063	265 822	516	129 000

The paper fraction will have several short-term potential users within the marketing area:

a) as an energy source (RDF),

b) as feedstock for insulation manufacturers,

c) as feedstock for production of building materials,

d) for dewatering sewage sludge.

With the possible exception of c) above, the mixed paper fraction separated by a municipal resource recovery plant, cannot be recycled by the paper industry as is the case with graded waste paper stock, due to the technical constraints imposed by the pernicious contaminants resulting from the heterogeneous mixture of municipal solid waste.

However, long-term potential for widespread use of the mixed paper fraction within the paper industry cannot be dismissed, since technology is presently being developed to overcome these technical constraints.

The calorific properties of the shredded paper fraction, in the range of 4000-6000 BTU/lb, encourage its use as a source of energy. This fraction as produced from a resource recovery plant can be used as a suspension fired fuel along with fossil fuels such as pulverized coal, gas or oil in process kiln operations or in boiler installations with or without travelling grates.

Additional processing of the shredded paper can provide a densified product such as a briquette which would be

used as a solid fuel for both grate and semi-grate boiler operations, thus expanding its use as a fuel source beyond that of suspension firing. However, because of additional costs, this treatment of RDF would have to be considered as a long-term development.

Demonstration tests are planned for 1977-78 to confirm the viability of RDF as a fuel source using material from the MOE Experimental Plant for Resource Recovery.

Only the currently proven processes of recovery of energy from the paper fraction are being considered at present, which means that even though such industrial processes as pyrolysis and/or gasification techniques are commercially available, associated high capital costs give such processes a low priority.

Furthermore, because of the dispersed industrial areas of the Municipality of Halton and the cyclic steam demands of these industries for process and heating, the use of RDF to produce steam is not a likely alternative.

The production of steam for subsequent generation of electricity to be used either by industry or by a PUC of a municipality, could be accommodated in several urban areas of Southern Ontario, including the Regional Municipality of Halton. However, the high capital costs associated with such a venture, when judged against the potential energy conservation and revenue, makes such a venture questionable.

However, the Halton Resource Recovery Plant would have available, by 1990, some 1063 ton/day of solid waste (Table I, p 6) or 530 ton/day of RDF. If we rate the RDF at 5000 BTU/lb and use a conversion factor of 10 500 BTU/KWhr[7], the potential electrical output would be 21 megawatts or, at a 100 percent utilization, 183 960 000 KWhr.

The Regional Municipality of Halton consumed in 1975: Campbellville, Acton, Georgetown, Milton, Oakville, Burlington, 1 805 000 000 KWhr. In addition, the rural areas of North Milton and Halton Hills, account for an extra 1½ percent making the total regional consumption as follows[8]:

- 1975: 1 830 000 000 KWhr
- 1976: 1 958 316 833 " .

Municipal solid waste in the Region of Halton will have, by 1990, a potential of producing some 183 960 000 KWhr at 100 percent utilization. More realistically, however, at 80 percent utilization, the output becomes 147 000 000 KWhr which represents about 8.0 percent of the total 1976 Regional consumption and would be less when compared to the projected 1990 consumption of electrical energy.

Alternately, the Region, in concert with private industry (Ford Motor Co. of Canada) could treat their combined municipal and industrial waste, respectively for the generation of electricity to be used by the industry in question to supplement power from Ontario Hydro.

Both alternatives to produce electrical energy from waste appear at the onset to be unattractive due to costs, although a detailed economic study of these options might prove otherwise.

The most promising short-term outlets for the RDF in the marketing area of the Regional Municipality of Halton are the energy intensive industries such as cement, brick and lime producers, with perhaps possiblities within the manufacturing and commercial sector where there are utility boilers utilizing coal, gas, and oil to produce heating and/or process steam.

Potential users of RDF have been identified in Appendix A from which the most promising specific industries in order of priority are:

- Cement: St. Lawrence Cement Co., Clarkson
- Brick: Domtar Construction, Clay Products Division, Cooksville
- Manufacturing: Ford Motor Co. of Canada, Oakville
- Lime: Domtar Lime, Beechville, Ontario.

However, there are two developments within the Halton marketing area which should not be overlooked as potential long-term outlets for RDF:

1. The "Watts from Waste" Project in which RDF will be tested, commencing in 1980, as a supplemental fuel to pulverized coal in one boiler at the Lakeview Generating Station of the OHEPC. Eventual capacity for RDF usage by the Lakeview

plant would exceed that available from the immediate area of the Borough of Etobicoke (Lakeview) and would then need to be supplemented with RDF from other areas.

2. The newly constructed linerboard mill of Reed Paper Co., in northeastern Mississauga, has process steam requirements equivalent to the steam-producing capacity of 75 000 tons of RDF per year or a 300 ton/day RDF plant on a five-day week.

Energy Markets - Cement

St. Lawrence Cement Co.,
2391 Lakeshore Road, West,
CLARKSON, Ontario. L5J 1K1
822-1653

G. Zulauf - Viçe-president
Jean Laneuville - Director of Research
Ludwik Kraszewski - Chief Engineer

This company should be considered as the highest priority to use the RDF from a Halton resource recovery plant. Some of the advantages of RDF utilization by St. Lawrence Cement are:

- operates continuously with three kilns,
- corporate interest in using RDF as a fuel,
- high energy demands,
- good accessibility,
- products of combustion are absorbed in kiln products.

On the other hand, some possible constraints are:

- perhaps a combustion restraint beyond 10-20 percent RDF usage,

- company utilizes cheap fossil fuels like waste petroleum coke, waste oil and low grade coals,
- RDF must compete on a cost per BTU basis with cheap coal delivered to the burner site at 1977 dollars of 1.05 million BTU's; assuming that the RDF price is initially discounted some 20 percent from the fossil fuel price, the competitive value of RDF is then $0.85/million BTU.

St. Lawrence Cement consumes about eight tons of pulverized coal per hour per kiln on the wet kilns (#1 and #2) while the #3 kiln, the dry operation, consumes 16 tons of coal per hour. Therefore, using coal at 12 500 BTU per lb, the daily energy requirements on kilns #1 and #2 are 11 440 x 10^6 BTU/day, with a similar energy requirement for #3 kiln, giving a total energy requirement of 22 880 x 10^6 BTU/day.

Since RDF contains approximately 10 x 10^6 BTU per ton, the total requirements for RDF on a 20 percent substitution rate over an average 310 day year would be 458 ton/day, which would require an RDF production over a 250 day year of 567 ton/day.

The wet kilns are the most likely area where RDF would be used initially, although its usage could be expanded to take in the #3 kiln assuming the RDF characteristics meet the requirements for their 'dry' kiln.

At a 20 percent substitution rate in the wet kilns, the equivalent daily requirement of RDF would be 229 tons; or, based on the RDF production year of 250 days, the daily required output from the resource recovery plant would be 284 tons of RDF.

The current demonstration project with Canada Cement Lafarge Ltd. will indicate the maximum substitution rates attainable when using RDF as an energy source in cement kiln operation.

Since the Halton Resource Recovery Plant is expected at the onset in 1980, to process 673 ton/day of solid waste and 842 tons in 1985, the RDF daily production or availability will be 336 tons and 421 tons, respectively.

In 1980, the supplemental use of all available RDF on three kilns would result in a 15 percent energy substitution rate, while in 1985, total use of available RDF would yield an 18 percent substitution rate. Should only the wet kilns be considered, in 1980 a 29 percent substitution rate would be attained and in 1985, a 37 percent substitution rate is required.

To accommodate RDF as a supplemental fuel, a potential user will have to assume additional capital expenditures to cover the necessary equipment. A price incentive or discount will be needed to give the potential user an opportunity to amortize these capital expenditures over a short term, after which the RDF price would become commensurate with the lowest fossil

fuel price.

A 20 percent discount for RDF from the existing lowest fossil fuel price available to the potential user, has been recommended, to provide this incentive.

Present coal prices at St. Lawrence Cement are $1.05 per million BTU delivered to the kiln giving then a value to RDF of $0.85 per million BTU or $8.50 per ton.

By 1980, oil and gas prices are expected to be about $3.40 per million BTU, as the price for Canadian crude oil approaches the world price. Coal probably will not escalate in concert with oil and gas because of large and expanding supplies as well as the poorer grades of coal available for cement kiln operations.

A realistic estimate by 1980 of the energy value contained in the low grade coals being delivered to St. Lawrence Cement would be $1.50 per million BTU, making then the discounted and competitive price of RDF $1.20 per million BTU or $12.00 per ton of RDF.

By 1985, and 1990, conservative estimates of RDF might be in the area of $2.00 per million (or $20.00 per ton of RDF); and $3.10 per million ($31.00 per ton) respectively.

Revenues derived from the sale of RDF to St. Lawrence Cement Co. are summarized in the following table.

TABLE II

REFUSE DERIVED FUEL REVENUES - ST. LAWRENCE CEMENT CO.

Year	Gross Revenue $/year	Net Revenue* $/year
1977	531 200	437 500
1980	1 008 000	840 000
1985	2 105 000	1 736 625
1990	3 999 000	3 483 000

* F.O.B. user

Energy Markets - Other

In reference to Appendix A, in which a number of industrial and commercial concerns within the Regional Municipality of Halton are listed with their energy requirements, it is readily seen that other than St. Lawrence Cement Co., the potential for shredded RDF to be fired in suspension as a supplemental fuel, is quite restricted.

However, a potential does exist with the following companies:

1. Brick Producers

   A. Domtar Construction, Clay Products Division, Mississauga.

      This company presently operates a kiln on "haydite" production and is contemplating a new kiln installation by 1979. It is conceivable that modifications to adopt

an RDF type of fuel can be incorporated at that time, should the results of current demonstration tests of RDF in other industries be encouraging.

B. Canada Brick Co., Burlington

Although operating brick kilns which in themselves are not easily adapted to firing of RDF, there is nevertheless an interest in using shredded RDF as a source of energy in the brick mixture itself.

Demonstration tests with shredded RDF from the Experimental Plant for Resource Recovery will, in 1977-78, provide the necessary data for this use.

2. Manufacturing

A. Ford Motor Co. of Canada, Oakville

Although the manufacturing plants of Ford Canada in Oakville have considerable steam requirements (Appendix B), there is a seasonal demand which deters from the use of a constant quantity of RDF in the boiler operations.

Of the five boilers at Ford, one is exclusively oil fired and four were converted from coal to oil with the four converted boilers having the potential for using natural gas. The conversion took place in 1972 and was carried out at considerable cost, but the company, nevertheless, maintains an interest in the use of RDF as a supplemental fuel in complete suspension or as a semi-grate

operation. However, the technical and financial constraints in reconversion on a part or total basis must be recognized.

In light of the technical constraints, it is not likely that Ford of Canada could proceed in the short-term at the Oakville plant to adopt RDF as a supplemental fuel.

It is intended, by Ford, that its current programme of sorting plant refuse materials and subsequent assimilation by the private sector will continue.

The Regional Municipality of Halton and the Ministry of the Environment should maintain contact with Ford of Canada in order to keep them posted on current uses of RDF while monitoring their interest at the same time.

The RDF demonstration tests conducted by the MOE Experimental Plant for Resource Recovery in other industries will provide useful data to Ford of Canada.

3. Lime Producers

Although the lime producers of the Beechville area remain a potential user of RDF, they are not listed in Appendix A as being a short-term possible market outlet for RDF from a resource recovery plant located in the Region of Halton. Nevertheless, their potentials were examined.

Lime producers operate rotary kilns, are energy intensive, and have an interest in conserving and reducing energy costs. Discussions with the three major lime producers on the use of RDF in their kilns, as a supplemental fuel to natural gas, have not elicited any firm commitments on their part, but nevertheless, have raised considerable interest.

The demonstration tests with RDF from the MOE Experimental Plant for Resource Recovery to take place 1977-78 with Canada Cement Lafarge in Woodstock, only a few miles from the Beechville area, will no doubt have an influence on the attitude of lime producers toward the use of RDF as a supplementary fuel.

The lime producers in the Beechville, Woodstock area produce some 2000 ton/day of lime.

Energy requirements for one ton of lime are approximately 7.4×10^6 BTU; the total energy requirement is estimated then at 14.8×10^9 BTU/day.

Oil and gas are primary fuels used at present, and plans are to continue with these fossil fuels unless a change back to pulverized coal is made or, for that matter, RDF can be adopted in the long term.

Equivalent RDF requirements on a daily basis to the 14.8×10^9 BTU would be 1480 tons of RDF. (One ton RDF contains 10×10^6 BTU). A 10 percent replacement of the oil/gas would require 148 tons of RDF/day on a 7-day week, or 208 tons RDF/day on a 5-day week. Since this 10 percent

replacement of fossil fuels represents some 62 percent of the potential RDF output from the Halton plant in 1980, contact with this industry will be maintained.

Cellulosic Insulation Market

The mixed shredded paper fraction from the Halton Resource Recovery Plant has a potential of being used as a cellulose base for the production of insulation.

Although this mixed paper fraction is cellulosic in nature, there are some contaminants which might inhibit use as a feedstock for manufacturing insulation. Such possible contaminants are small amounts of film plastic, cardboard and perhaps the waxes/glues that might be contained in waste packaging.

Trial tests are being conducted with a shredded mixed paper fraction and this material will be evaluated for performance by the Ontario Research Foundation in accordance with Canadian Government Specifications covering cellulosic insulation. The effects of the apparent contaminants will also be studied.

Should the mixed paper fraction prove to be satisfactory, there would appear to be some advantages for the manufacturer to use this material:

a) mixed fraction will be partially shredded, thus reducing energy consumption needed to grind the mixed paper to a fine mesh,

b) material will be baled and this provide easier on-site storage,

c) the municipal resource recovery plant should provide a constant source of material at presumably stable prices.

1. Manufacturers

Although there is not a manufacturer of cellulosic insulation within the Regional Municipality of Halton, there are, however, several producers located in the surrounding areas, within a 75-mile radius. These are:

a) Fibre Therm Insulation Ltd.
169 Centre Street, East
RICHMOND HILL, Ontario
L4C 1A5
(416) 884-1674

b) Cellulose Insulation Ltd.
12 Progress Avenue
SCARBOROUGH, Ontario
M1P 2Y4
(416) 229-8105

c) Attic Insulation Ltd.
7330 Victoria Park Avenue, Unit A,
SCARBOROUGH, Ontario
(416) 495-1640

d) Pal-O-Pak Manufacturing Co.
85 St. Peter St.
LINDSAY, Ontario
K9V 5T8
(705) 324-6502

e) Weathercheck Insulation Ltd.
8241 Keele Street
TORONTO, Ontario
(416) 669-1461

f) Canadian Comfort Insulation Ltd.
P. O. Box 100
PUTNAM, Ontario
(519) 285-2031

g) Axler Waste Systems
43 Florence Street
TORONTO, Ontario
M6F 1P4
(416) 531-1124
Plant location: Mississauga

2. Usage

Cellulosic insulation producers currently use, as a feedstock, used newspapers which are purchased from the waste paper stock dealers and/or community paper drives.

Pal-O-Pak, located originally in Whitby, Ontario, has been in production over thirty years and currently consumes some 3000-5000 ton/year of used newspapers and overissue news and has recently relocated a plant in Lindsay, Ontario. Other manufacturers have recently initiated production and their total consumption of used newspapers is estimated at 40 000 ton/year.

The market is increasing rapidly due to the impetus now on insulating older homes. Although this market will eventually become saturated, possibly by 1985, new construction should continue to make a demand on the suppliers of insulation.

3. Value

The price being paid by insulation manufacturers for used newspapers varies depending upon the source.

However, one manufacturer presently pays $40/ton but is subject to the fluctuating prices on the paper stock market as indicated in Appencix C which outlines the past ten year's price performance for #1 news as quoted in the Official Board Markets (Buffalo, N.Y. buying price).

It is conceivable that used newspapers may, in the long-term, be recycled in greater amounts to the pulp and paper industry thus applying pressure on the insulation manufacturers to find alternate sources of feedstock. The shredded mixed paper fraction is one alternative source, if present testing proves successful.

Estimated prices and revenues are summarized in the following table, arbitrarily assuming a Halton plant were to supply 30 percent of this market demand.

TABLE III

POTENTIAL REVENUES FROM CELLULOSE FIBRE INDUSTRY

Year	Usage ton/year	Value $/ton Gross	Net*	Net Revenue $/year
1980	16 000	30	22	352 000
1985	20 000	40	30	600 000
1990	10 000	47	35	350 000

* F.O.B. user

Construction Materials Market

1. Background

The air separated mixed paper fraction from the Halton Resource Recovery Plant has a potential of being used as a partial feedstock for making certain types of construction materials, e.g. roofing felts and building board. Currently, mixtures of waste newspapers, corrugated, wood chips and/or sawdust are used to make such types of building materials.

2. Markets

Several companies have expressed an interest in the light fraction and will be conducting research and production tests with the light fraction when it becomes available from the Experimental Plant for Resource Recovery. Typical of the companies who might have an interest in the paper fraction are:

a) Domtar Construction Materials
THOROLD, Ontario
SENNERVILLE, Quebec (Research Centre)

b) Canadian Johns-Mansville Co. Ltd.
5421 Lawrence Avenue, East
WESTHILL, Ontario
M1E 4S3

c) IKO Industries Ltd.
71 Orenda Road
BRAMPTON, Ontario
L6W 1V8

Domtar Construction in particular, will during 1977-78 evaluate the light paper fraction as a mill raw material for making construction roofing felts.

3. Usage

The potential usage is 8000 - 10 000 ton/year, should it be applicable, representing some 10 percent of the maximum output of the paper fraction from a resource recovery plant in the Municipality of Halton.

4. Value

The value of the mixed paper fraction will be governed by the value of the used newspaper and corrugated stock which over the years has fluctuated in accordance with demand from the overall paper industry (Appendix C).

However, a constant source and stable contract price, both of which would be offered by a resource recovery plant, would be very attractive to a potential user.

Gross values obtainable through the dealer system of $25/ton in 1977, $30/ton in 1980, $40/ton in 1985, and $47/ton in 1990 are projected from the Official Board Markets historical record of prices and the paper industry, which has forecast a pending fibre shortage by 1990. Higher prices would probably prevail if the paper fraction were to be shipped directly to the user.

5. Revenues

Estimated revenues are based on the gross value expected at the user plant and the net value after removing estimated freight costs.

TABLE IV

PROJECTED REVENUES FROM CONSTRUCTION MATERIALS MARKET

Year	Usage ton/year	Value $/ton Gross	Net*	Revenue $/year Gross	Net
1977	8 000	25	21	200 000	168 000
1980	10 000	30	25	300 000	250 000
1985	25 000	40	34	1 000 000	850 000
1990	30 000	47	40	1 400 000	1 200 000

* F.O.B. user

Sludge Dewatering

1. Background

Because of an ability to dewater and the inherent BTU values (5000 BTU/lb), the addition of a shredded paper fraction to sewage sludge prior to incineration can result in lower fuel costs and elimination of conditioning chemicals of lime and ferric chloride.

This use for shredded paper fraction, although not considered a prime outlet for a resource recovery plant in the Regional Municipality of Halton, is being recognized here as a potential long-term market.

Although sewage sludge incinerators are found in only a few municipalities, i.e. Toronto, Hamilton and London, there always remains the possibility that additional incinerators may be required to treat sewage sludge.

Every accessible urban area then becomes a potential outlet for a shredded paper fraction.

2. Usage

Currently 70 000 dry tons of sewage sludge are being incinerated annually in the three municipalities; this represents 40 percent of the total sludge requiring disposal in Ontario. Experimental work done to date indicates polymer and paper addition at a rate of 30 percent by weight of the sludge provides adequate conditioning for dewatering.

Experimental work will be continued throughout 1977-78 using the paper fraction from the Ministry's Experimental Plant for Resource Recovery. Parameters on the usage of the shredded mixed paper fraction will be established.

3. Value

The shredded mixed paper fraction which must compete against used newspapers will reduce fuel costs because of its BTU value and the subsequent autogeneous nature of the dewatered mixture during the incineration.

Chemicals, such as lime and ferric chloride, will be eliminated. A net value to the paper fraction not yet established should be ascertained over 1977-78.

SHREDDED FERROUS FRACTION

Background

Municipal ferrous scrap (MFS), magnetically separated from a resource recovery plant, is anticipated to have a recovery rate of 5 percent of the total municipal solid waste processed so that a nominal 1000 ton/day plant will yield 50 ton/day, 1000 ton/month, and 12 500 ton/year of ferrous scrap.

The resource recovery study report[2] indicates that processable solid waste handled by a resource recovery plant in Halton would be 673 ton/day in 1980, 842 ton/day in 1985, and 1063 ton/day in 1990.

The ferrous fraction at a 5 percent recovery rate would be:

TABLE V

ESTIMATED FERROUS MATERIAL RECOVERY

Year	Processable Solid Waste tons		Shredded Ferrous tons	
	Daily	Yearly	Daily	Yearly
1980	673	168 354	33	8 418
1985	842	210 597	42	10 500
1990	1063	265 872	53	13 291

Traditional markets for municipal shredded ferrous material from a resource recovery plant are the de-tinning, ferro-alloy and copper extractive industries.

The MFS has been sold either directly or through scrap dealers.

As a commodity, MFS must also be considered as a form of steel scrap to be evaluated on the market place as a source of iron units, generally purchased by steel and iron mills for 'melting stock'.

However, MFS has characteristics both metallurgical and physical which inhibit its widespread use as a source of a melt stock.

Physically, such scrap consists primarily of thin gauge steel beverage and food containers (tin cans) which accounts for the low bulk density of the product (25 lb/cu ft), a fact which not only restricts its movement over long distances because of excessive haulage costs, but also prevents its usage directly as melt stock.

Metallurgically, tin cans which are the major portion of MFS contain residual metallic elements of tin, lead, and aluminum due to the coating, solder and ends, respectively. These metallurgical residuals inhibit the widespread use of the ferrous scrap as melt stock unless an additional processing step removes these so-called undesirable elements. The detinning industry can perform this task, thus making MFS more acceptable to the iron and steel industry as melt stock.

Physically, the shredded MFS can be made denser by either of two additional processes:

a) baling into suitable sizes, e.g. 12" x 12" x 12" with a density of 100 lb/cu ft, and higher; and

b) nuggetizing into a smaller, shredded, denser product, to a density of 60 lb/cu ft, and higher.

Iron and steel melts require their steel scrap melt stock to be a high bulk density, so that MFS would have to undergo densifying by either of the above processes before it becomes physically attractive as a source of scrap.

Despite these apparent constraints peculiar to shredded municipal ferrous scrap, the product has been offered to a variety of iron and steel industries in a concerted effort to look at all alternative markets as well as to maximize the net revenue of a resource recovery plant located in the Regional Municipality of Halton.

Markets for municipal ferrous scrap (MFS), from the Halton Resource Recovery Plant have been considered within the following industries:

a) Primary: - de-tinning industry
- ferrous scrap dealers

b) Alternate:
- iron foundries
- mini steel mills
- abrasive steel shot manufacturers
- tonnage steel mills
- copper extraction industry
- ferro-alloy producers

Because of the excessive haulage costs from the Halton area, we can eliminate the copper extractive and ferro-alloy industries, both located in the Province of Quebec.

The remaining markets are within the Halton area. Of these remaining markets, two will accept shredded low bulk density MFS as produced from the resource recovery plant, i.e. the de-tinning industry and ferrous scrap dealers.

De-tinning Industry Market

This industry, represented by M & T Chemicals Ltd., 670 Strathearn Avenue, Hamilton, Ontario (25 miles from a Halton Resource Recovery Plant) is the primary market for the shredded MFS, which would be shipped directly to M & T without additional processing.

M & T have already expressed by letter an interest in the MFS produced from a Halton plant.

1. Values

Revenue from the sale of MFS to the de-tinning industry is based on a price formula offered by M & T Chemicals Ltd. which is 40 percent of the #1 bundle price

(dealers asking) per net ton, Hamilton as quoted in the weekly publication Iron Age. On February 17, 1977, the #1 bundle price, Hamilton was $40 per net ton. (Net tons of 2000 lb are quoted in Canada, gross tons of 2240 lb are quoted in the U.S.).

The #1 bundle prices, Hamilton, have fluctuated over the years as shown in Appendix D with the lows in the $20 range and highs in the $88 range. The current #1 bundle price in all probability will remain static over the year 1977; however, it is difficult to predict 1980 or 1985 prices. The prices on most commodities escalated to extreme levels in 1974, and are not likely to respond in a like fashion again.

However, a user cost in the $70-75 range in 1980-1985 might be reasonable assuming the 1977 level moves slowly upwards from its current static position because of expected economic recovery and forecasts of scrap shortages in the years ahead.

M & T Chemicals Ltd. continue to use their pricing formula based on the #1 bundle price although a contractual arrangement based on a set price with a floor level could probably be negotiated.

2. Revenues

If the Halton resource recovery Plant were operating in 1977, the gross revenue on MFS sold to the de-tinning industry would be based on the range of $12 per net ton to $20 per net ton.

The net revenue in 1977 for a plant located in Halton would be based on $9 per net ton to $17 per net ton.

In 1980-1985, a range of $28 per net ton to $30 per net ton is possible, but at this stage only conjecture.

TABLE VI

DE-TINNING INDUSTRY - REVENUE

Year	MFS ton/year	Value $/ton Gross	Net*	Net Revenue $/year
1977	6 250	16	13	81 250
1980	8 418	28	24	202 000
1985	10 530	30	25	263 250
1990	13 291	32	26	345 540

* F.O.B. user

Ferrous Scrap Dealers

These dealers and/or brokers are part of a large and complex network of companies comprising the secondary materials industry. Some are specialists, dealing with paper or ferrous metals only, others deal with all scrap or secondary materials. In essence, they reclaim and recycle useful commodities.

Although there are many dealers, there are some* in or near the Regional Municipality of Halton who have shown interest in shredded municipal ferrous scrap.

---

* This list must not be construed as being the only dealer companies interested in MFS.

These are:

a) Waxman & Sons Ltd.
Burlington Street, East
HAMILTON, Ontario
(416) 545-3031

b) Worth Metal Co.
801 York Mills Road
DON MILLS, Ontario

c) Industrial Metals
Cherry Street
TORONTO, Ontario M3B 1R7
(416) 447-4051

d) Front Iron & Metals Co.
40 Parliament Street
TORONTO, Ontario

e) Bristol Metal Industries of Canada Ltd.
252 Unwin Avenue
TORONTO, Ontario M5A 1A3
(416) 463-5971

f) Intermetco Ltd.
Metals Recycling Division
L. D. Jackson Square
HAMILTON, Ontario
(416) 528-1191

g) S. Lax & Sons Ltd.
80 Brant Street
HAMILTON, Ontario

h) J. Rosen Co.
61 Balzar Road
KITCHENER, Ontario
(519) 743-0241

Although no one dealer has offered a firm commitment for MFS produced from a resource recovery plant in Halton, there is nevertheless an interest. Furthermore, past performances indicate that scrap dealers will accept the product, as produced from a resource recovery plant, although the prices offered can

vary, but will compete with the value offered by the de-tinning industry.

The MFS produced from the Ministry of the Environment ERRP, commencing in early 1978, will establish a price pattern which the Regional Municipality of Halton can use as a guide when their plant becomes operational.

The current prices (mid-1977) offered by dealers to other municipalities have ranged from $5 per net ton to $16 per net ton.

One can expect prices to be competitive with those offered by the de-tinning industry, particularly since the ERRP will have, by then, demonstrated a creditibility for this product on the market place.

Alternate Markets

Alternate markets for MFS as produced from a resource recovery plant in Halton have been explored. Specifically, these markets are the iron foundry industry, mini steel mills, and steel shot abrasive producers.

In each of these markets, the MFS needs to be densified by either of the two earlier described processes.

The ERRP is currently testing and demonstrating densified MFS within these markets:

1. Iron Foundries

Almost all iron foundries utilize ferrous steel scrap prepared to the proper size by dealers with the exception of shredded automobile scrap which is used as received from the scrap processor. Foundries using shredded

automobile scrap in greatest quantity are those operating induction furnaces, a trend which has been going on now for some years. The baled MFS can be used by iron foundries operating the cupola furnaces or the direct arc electric furnace.

Contact has been made with almost all significant iron foundries within the Halton Region; trial runs have already been conducted with baled MFS (unde-tinned) with several of these foundries, and plans are now underway to investigate not only the nuggetizing of MFS but the use of that product in select foundries.

Interest in MFS has been expressed by almost all iron foundries. If the metallurgical constraints are overcome, and a price incentive provided, there is no doubt that MFS, in the baled, densified form, will be acceptable and consequently, purchased.

The residual amounts of tin, lead, and aluminum, although of concern to cast iron producers, are not a major constraint to high quality as is the case in steel, so that a more liberal use can be made of the MFS without it being de-tinned.

A. Markets

Within a 30-mile radius of Halton Regional Plant

	Type	Estimated Usage ton/year
** J. A. Wotherspoon Co. Ltd 148 Cross Street OAKVILLE, Ontario 845-2873	Baled MFS	2 500

		Type	Estimated Usage ton/year
*	Brown & Boggs Co. Ltd. 175 Sherman Ave. North HAMILTON, Ontario 549-6594	Baled MFS	1 500
	Hamilton Foundry Co. Ltd. 33 Clinton Street HAMILTON, Ontario 544-0740	" "	1 000
	Canron Ltd. Stuart Street Box 633 HAMILTON, Ontario 527-9171	" "	70 000
*	Canron Ltd. Burlington Street, East HAMILTON, Ontario 547-5810	" "	18 000
*	John T. Hepburn Co. Ltd. 914 Dupont Street TORONTO, Ontario M6H 1Z2 534-8871	" "	3 000
***	Crouse-Hinds Co. Birchmount Road SCARBOROUGH, Ontario 757-8781	Nuggetized MFS	2 000
	Dayton-Walther Co. GUELPH, Ontario	Baled and Nuggetized MFS	5 000
**	Babcock-Wilcox Canada Ltd. Grand Avenue GALT, Ontario	Baled MFS	500
*	Bibby Foundry Co. Ltd. Box 279 Galt, Ontario	" "	5 000
*	McCoy Foundry Ltd. TROY, Ontario (519) 647-3411	" "	6 000

	Type	Estimated Usage ton/year
Lake Foundry & Machine Co. Ltd. South Service Road GRIMSBY, Ontario L3M 1Y6	Baled MFS	500
Rockwell Mfg. Co. Box 848 GUELPH, Ontario (519) 836-2840	Nuggetized MFS	1 500

Within a 40-mile radius of the Halton Regional Plant

	Type	Estimated Usage ton/year
Massey-Ferguson Co. Box 370 BRANTFORD, Ontario (519) 753-2681	Baled MFS	10 000
Canada Valve Co. 36 Water Street, South KITCHENER, Ontario (519) 576-0410	" "	1 500
*** Crowe Foundry Ltd. Box 460 HESPELER, Ontario (519) 638-9376	Nuggetized MFS	6 000
** Date Industries Swan Street AYR, Ontario	"	1 000
* McLean Foundry Ltd. 247 Colborne St. West BRANTFORD, Ontario N3T 5T3	"	1 000

Within a 75-mile radius of the Halton Regional Plant

	Type	Estimated Usage ton/year
* General Motors Canada Ltd. Foundry Division ST. CATHARINES, Ontario	Baled MFS	141 000

	Type	Estimated Usage ton/year
* Cunningham Foundry & Machine Co. Berryman Avenue ST. CATHARINES, Ontario L2R 2Y6	Baled MFS	1 500
** Dart Foundries Co. Ltd. Eagle Street STEPHENVILLE, Ontario	" "	1 000
** Kelsey-Hayes Canada Ltd. WOODSTOCK, Ontario	" "	15 000
Crawford Foundry & Machine Co. WOODSTOCK, Ontario	" "	200

* have run trial lot of baled MFS without being de-tinned

** have expressed an interest in using trial amounts of baled, unde-tinned MFS

*** have expressed an interest in MFS in the nuggetized form

Trials have been conducted with success in some of these plants and MFS from the ERRP, North York, when it becomes available in early 1978, will be used in demonstration runs in those foundries which are appropriate to the marketing area of the Halton Region.

This group of iron foundries consumes, on the average, some 206 000 tons of ferrous scrap per year, not all of which is steel scrap since a major portion is purchased cast iron scrap.

A conservative 10 percent of the total would yield a potential market of 22 000 ton/year available to the Halton plant.

However, as test runs proceed with the MFS from the Ministry's Experimental Plant, a more specific target area will be outlined.

2. Mini Steel Mills

These steel producers are small compared to the large tonnage basic steel producers (Stelco, Dofasco, Algoma, Atlas) and there are only two producers of interest to the Halton Region:

a) Lake Ontario Steel Co. (LASCO), within 75 miles
Hopkins Street
WHITBY, Ontario

b) Burlington Steel Co.
Division of Slater Industries
Sherman Avenue North
HAMILTON, Ontario.

Steel production is from direct arc electric furnaces utilizing a 100 percent ferrous steel scrap, or a mixture of steel scrap and metallized iron pellets.

Consumption of steel scrap is high in both these plants. For instance, at LASCO, about 1100 ton/day of scrap is consumed.

The products of mini steel mills are varieties of bar stock including reinforcing bar. Metallurgical constraints, although stringent, are perhaps not as severe as those in many

carbon and stainless steels; consequently, MFS in the unde-tinned condition can be tolerated by these mini mills in larger quantities than those for the larger basic steel mills producing wide varieties of carbon steel and stainless steel products.

Scrap is handled by dealers to each of these two steel producers. In the case of LASCO, a wholly-owned subsidiary - Industrial Metals, Toronto - buys all scrap on the market for the steel plant. Burlington Steel, on the other hand, deals with a broker. LASCO has already made several experimental trials with baled MFS in the unde-tinned condition; the results of which LASCO considered to be successful enough to warrant their placing an order for a large tonnage of MFS, to be delivered to them when it becomes available from the ERRP, early in 1978.

Burlington Steel has been noncommittal about using unde-tinned MFS; preferring to have their broker handle all scrap purchases.

LASCO, some 60 miles distant from Halton, could likely consume all of the MFS output from the regional resource recovery plant.

3. Tonnage Steel Mills

a) Steel Co. of Canada Ltd. (STELCO)
HAMILTON, Ontario

b) Dominion Foundries & Steel Co. (DOFASCO)
HAMILTON, Ontario.

c) Atlas Steel
WELLAND, Ontario.

These three steel mills along with Algoma Steel in Sault Ste. Marie are the largest steel producers in Canada, and Stelco, Dofasco, and Atlas are within the Halton marketing region.

However, these producers have not been considered prime markets for MFS, although they consume large amounts of ferrous scrap annually and actually set the market prices for scrap by virtue of their large buying patterns.

The residual tin (0.35 percent) content of MFS, as produced at the resource recovery plant, is high enough to be considered a metallurgical constraint in their type of steel production. MFS could be utilized after it had been de-tinned by the de-tinning industry; in this case, the de-tinning industry becomes the primary market, not the steel mills.

However, the steel industry has stated that it could conceivably utilize unde-tinned MFS at a maximum level of about 2 percent of its total scrap usage, thus diluting the residual tin content sufficiently to remain under the tolerable level. However, the extra stringent controls necessary to maintain an acceptable low level of tin in the finished steel are enough to deter the plants from utilizing unde-tinned MFS, at this stage.

Consequently, the alternate markets of iron foundries and mini steel mills have been explored, even though their total ferrous scrap usage is small compared to the large basic steel plants.

4. Metal Shot Abrasives

Production of steel shot and grit as a metal abrasive is a new industry in this country. CAE Metal (in conjunction with Cleveland Abrasives, Inc.) have established a new plant in the Welland area:

Cleveland-CAE Metal Abrasives
650 Rusholme Road, Box 634
WELLAND, Ontario L3B 5R4
(416) 735-7430

Municipal ferrous steel scrap in the unde-tinned condition could be utilized by CAE with some metallurgical constraints; but would, however, have to be densified into small bales.

CAE will produce its product from a 100 percent steel scrap base, using a direct arc electric furnace.

Consumption of total scrap, starting in July, 1977, will be about 6000 tons, increasing to 18 000 tons by 1980, and 20 000 tons by 1985.

MFS consumed by this company could be a conservative 4000 ton/year by 1980.

Values

Ferrous scrap prices paid by the iron foundries, mini steel mills and abrasive steel shot producers, are governed by market conditions. The index of steel production is the barometer reflecting general economic conditions which, in turn, affect both the degree and price of scrap purchases.

Stelco buying prices for #1 scrap, Hamilton, usually set the pattern for others, although the iron foundries will almost always pay slightly more for their prepared steel scrap.

1. Mini Steel Mills (LASCO)

The price paid by mini steel mills for scrap is determined by Stelco, Hamilton buying price for #1 heavy melting scrap, or by #1 bundles. As of July, 1977, the price for the latter was $60/ton, a level which might hold through 1977 and increase slightly over the next four years.

With this price structure, the Halton Resource Recovery Plant would net about $14/ton after removing the haulage cost and the cost for having the loose MFS baled into a suitable form for the steel plant. This latter cost, because it is based on a custom service, is quite high, although for future action, it is conceivable that the Resource Recovery Plant could lower this baling cost by incorporating a ferrous baler within its operation, or alternately by negotiating a satisfactory long-term baling contract with the private sector.

A. LASCO

In February, 1977, the Stelco buying price of $60/ton for #1 scrap was also the LASCO buying price. To provide the incentive and accommodate the presence of so-called undesirable residuals in unde-tinned MFS, the #1 price has been discounted $15/ton so that the F.O.B. price now becomes $45/net ton.

The Halton Resource Recovery Plant would net about $14/ton after removing the haulage costs and the preparation costs of baling the loose MFS. This latter cost, however, is speculative at this time since a resource recovery plant could conceivably incorporate a ferrous baler and thus dispense with buying this service on the open market. Alternately, the private sector could possibly accommodate this service at a more reasonable cost.

B. Gray Iron Foundries

Steel scrap prices paid by Gray Iron Foundries in 1977 vary from $75/ton to $85/ton. Again, after discounting to an average $60/net ton and removing the haulage and baling costs, the Halton Resource Recovery Plant would net about $25/ton.

C. Steel Abrasives

The price paid by the industry is similar to that paid by the iron and steel foundry industry.

D. Revenues

Forecasting ferrous steel scrap prices to the year 1990 is highly speculative, even though some steel industry spokesmen[9, 10, 11] have predicted a shortage of select steel scrap by the 1980's. This might indicate a gradual increase in steel scrap prices.

CORRUGATED CARDBOARD - USED NEWS

The resource recovery plant will likely undertake manual separation, prior to processing, of the clean corrugated cardboard and bundled used newspapers.

It is estimated that a resource recovery plant in Halton would recover, in 1977, about 25 tons per day of corrugated and 10 ton/day of used newspaper based on past experience with other community efforts to recover these products. Expected recoverable amounts are summarized below.

TABLE VII

ESTIMATED WASTE PAPER RECOVERY

Year	Processable Waste ton/day	Used News		Corrugated	
		ton/day	ton/year	ton/day	ton/year
1977	500	10	2 500	25	6 250
1980	673	13	3 250	32	8 000
1985	842	16	4 060	45	11 250
1990	1 063	20	5 000	50	12 500

Markets

1. Corrugated Cardboard

Markets for corrugated are well established with the movement of this material handled by one of many waste paper stock dealers or going directly to an end user. A market trend appears to be developing toward a tight supply of corrugated cardboard. Increased demand, because of new and

expanded board plant capacities, may be a harbinger of the future supply situation.

A. Users

	Product Output ton/year	Fibre Consumption ton/year (12)
Atlantic Packaging Company 111 Progress Avenue SCARBOROUGH, Ontario M1P 2X9	90 000	30 000
Beaverwood Fibre THOROLD, Ontario	84 000	17 000
Reed Paper Company Corrugating Mill MISSISSAUGA, Ontario	100 000	35 000
Continental Group Commissioner Street TORONTO, Ontario	100 000	35 000
Sonoco Ltd. 2299 Drew Road BRANTFORD, Ontario	45 000	40 000
Domtar Construction Materials THOROLD, Ontario	25 000	8 000
IKO Industries 71 Orenda Road BRAMPTON, Ontario L6W 1V8	33 000	12 000

B. Major Brokers and Dealers (12)

Dominion Recycling Ltd.
186 Shawson Drive
MISSISSAUGA, Ontario L4W 1R7
(416) 676-1432

Reed Ltd.
145 King Street, West
TORONTO, Ontario M5H 1J8
(416) 862-5191

E. Krever & Associates Limited
150 Consumers Drive, Suite 105
WILLOWDALE, Ontario M2J 1P9
(416) 491-4147

Mill Paper Fibres Ltd.
20 Trinity Street
TORONTO, Ontario M5A 3C5
(416) 364-6255

Consolidated Fibres of Ontario
95 Commissioner Street
TORONTO, Ontario M5A 1A6
(416) 461-0211

Ennis-Scony Fibre Ltd.
302 Murray Street
BRANTFORD, Ontario
(519) 756-5264

NOTE: This is not a complete list. There are other brokers and dealers available.

C. Market Value

Values for the corrugated are well established on the market place and generally governed by the prices established weekly in the "Official Board Markets". Appendix C outlines a history of the highs and lows for corrugated material.

Prices are expected to hold their current levels (1977) and probably increase slowly over the long-term predicated on the tightening market for supply along with increased product production.

Although F.O.B. user prices have fluctuated over the past ten years, a realistic range for 1977 is probably $25-35/ton, about $30-40/ton for 1980, and

$45-50 for 1985, and in the range of $50-55 by 1990.

D. Gross Revenues

1977:	6 250 tons at $30/ton	=	$ 187 500/year
1980:	8 000 tons at $35/ton	=	280 000/year
1985:	11 250 tons at $47/ton	=	528 750/year
1990:	12 500 tons at $52/ton	=	650 000/year

2. Waste News

Waste news markets are not as active as the corrugated with more being handled by the waste paper stock dealers. Whereas the corrugated may be shipped directly to end user mills, it is likely that waste news would be handled by paper dealers before going to the mill, if only to grade the paper and control the shipments to each mill.

A. Markets

i) Waste Paper Dealers

The waste paper dealer becomes the primary market outlet for used news, and, in turn, will direct this waste to the appropriate segment of the paper industry for recycling purposes.

ii) Cellulosic Insulation Manufacturers

Insulation manufacturers currently use waste newspapers for the manufacture of cellulose insulation. Although the shredded mixed paper fraction of a resource recovery plant may substitute for waste news as a feedstock for insulation, used newspapers will still be directed to this market. (See Page 20).

iii) Animal Bedding

A relatively new market area where shredded newspapers may be used to replace straw and wood shavings currently being used for animal bedding. Individual farmers, feedlots, and stock yards represent potential outlets for this product.

iv) Molded Fibre Products

The production of molded products from waste paper fibres has been the basis of a small industry. In particular, products such as molded flower pots, planting boxes used extensively by the homeowner, nurseries and gardeners, are manufactured by one company located in the Regional Municipality of Halton:

Kord Products Ltd.
1094 Northside Road, Progress Park
Box 5016
BURLINGTON, Ontario L7R 3Y8

Usage

Kord Products consumes 9 ton/day, 3 000 ton/year - June, 1977, of waste news for the production of molded pots.

This operation in Halton could represent a small additional market for any manually separated used newspapers that might be collected in conjunction with a resource recovery plant.

Values

Currently (July, 1977) the delivered price for baled used newspapers is in the range of $40-45/ton from paper stock dealers. Local sources, excluding the dealers, are offered for bundled loose used newspapers is in the range of $25-30/ton.

Values

Again, based on the past performance of the used news market (Appendix C), along with the possibility of increased uses for waste paper being established within the paper industry, one could expect the current F.O.B. user prices in 1977 to be $30-35/ton to increase to $40/ton by 1980, to $45/ton by 1985, and to $47/ton by 1990.

However, the value of this product may have a different level in each market outlet. There may be times when the insulation market may net a higher price than that offered by the paper stock dealer.

Table VIII summarizes estimated revenues from recovered corrugated and waste news.

OTHER COMMODITIES

Although the shredded paper fraction (RDF), the ferrous material, and the manually separated corrugated cardboard and newspaper represent the commodities of the 'front-end' resource recovery plant that will be sold on the market

TABLE VIII: ESTIMATED REVENUES FROM CORRUGATED AND WASTE NEWS

Product	Year	Recovered Amounts ton/year	Gross Price $/ton	Net Price * $/ton	Net Revenue $/year
Corrugated	1977	6 250	30	27	168 750
	1980	8 000	35	31.50	252 000
	1985	11 250	47	41.80	470 250
	1990	12 500	52	44.30	553 750
News	1977	2 500	32	28	70 000
	1980	3 250	40	31.50	102 400
	1985	4 060	45	38.20	155 100
	1990	5 000	47	40.00	200 000

* F.O.B. user

place, there are other separable materials which may be of commercial interest at some future date.

For instance, recovered glass, rubber, and non-ferrous materials (copper, aluminum) are several of these commodities; which, although recovered extensively now throughout the secondary materials industry, are nevertheless present in the solid waste stream and are recoverable.

Additional processing is required at a 'front-end' resource recovery plant in order to separate these materials from the waste and to upgrade their quality to meet market specifications.

Markets for waste glass, rubber, plastics, and non-ferrous materials are currently being investigated and monitored either directly with the potential users or through the secondary materials industry.

The Experimental Plant for Resource Recovery will provide the impetus for the development of suitable separation techniques and subsequent product standards as well as market testing for these recoverable commodities.

DISCUSSION

MARKETING OF SECONDARY MATERIALS

This study has examined the market potentials for the products recovered from the 'front-end' resource recovery plant proposed for the Regional Municipality of Halton. Although particular attention was given to markets within the Region, other outlets in the surrounding areas were also explored in order to develop, not only alternate markets, but also additional opportunities to maximize the total revenue.

Based on market trends of supply, demand and prices, revenues have been established for the years 1977 through 1990 showing a total dollar revenue escalation of six-fold with the largest increase, seven-fold, coming from the energy value (RDF), followed by the ferrous fraction with a four-fold increase. Manually separated clean corrugated and waste news increase in total value some three-fold over the same period.

It is possible to deal with absolute amounts of both the shredded mixed paper (RDF) and ferrous fractions separated in a resource recovery plant of fixed capacity. Ascertaining, in advance, however, definitive amounts of corrugated and waste news that might be manually separated at a resource recovery plant is speculative, consequently revenues attributed to these products can only be gauged from the historical price trends of waste paper stock as well as the

experiences of community efforts in collecting these materials. Although the revenues from the sale of these products will contribute to the overall dollar value of recoverable products, the main thrust will have to be with the two major definitive products which show almost a seven-fold increase in total values over the 1977-1990 period.

There are a number of markets for the two products so an opportunity does exist for the Region to negotiate and maximize its revenues.

Within the Halton Region, the shredded mixed paper fraction can be used as a source of energy (RDF), as a potential feed stock for such end products as building materials, cellulose insulation, and other cellulose-based products. A technological breakthrough on the separation of plastic from paper in the shredded paper fraction could open up a widespread use of this fraction as a source of secondary fibre for the paper industry. Plastic as a distinct product then would also become a marketable commodity.

Other extraneous products, e.g. rubber, glass, non-ferrous material, would at best, however, be separated only after additional plant processing beyond the 'front-end' stage, thus incurring an additional unit cost for recovery of these products. Hence, the feasibility of recovering these materials would have to be investigated further.

Recovery, however, of these extraneous products could be anticipated at a later stage by making the design of

the 'front-end' resource recovery plant flexible so that unit processes could be added at a later date to accommodate the separation of such products, probably at a time when unit costs and market values are more compatible.

As world energy prices escalate over the years, and the demand for traditional sources of fossil fuels becomes more competitive, it is likely that RDF value per BTU will rise.

Energy (RDF) should then be the prime use for the shredded paper fraction and it should be directed to the energy intensive cement industry, which in itself is a stable, growing sector of the industrial economy. In particular, St. Lawrence Cement Co. should be the initial recipient of the RDF from the Halton Plant. St. Lawrence has the capability of using the total RDF output by utilizing a 15 percent substitution rate in 1980, and a 25 percent rate in 1990.

Within the clay products, brick and lime sectors, there are other potential secondary outlets in the Halton Region for RDF, and these should be given consideration and will, of course, be examined prior to the construction of the Halton Plant, by using the RDF product from the Ministry's Experimental Plant for Resource Recovery. In the manufacturing area, Ford Motor Co. of Canada has a capacity for steam generation and usage but the cyclic nature of its demand and the currently established use of oil as a fuel, mitigates against the short-term use of RDF. Nevertheless, consideration, undoubtedly, will

be given by Ford to various energy options over the long-term; so RDF usage will remain as a distinct possibility.

A number of users exist throughout the Halton marketing area for the ferrous fraction, whether it be in its shredded form or in a processed densified form. A choice exists, as a source of iron units for the iron and steel industry or as a feedstock for the de-tinning industry. Initially, the Halton Region should consider the de-tinning industry as its primary outlet and, more specifically, M & T Chemicals Co., which is the only de-tinning company in Canada. However, the industry is stable and represents a sound long-term market.

Nevertheless, to maximize revenues, the Ministry and the Region of Halton should consider and negotiate with all potential users of the ferrous product. Once the creditibility of the product as a source of iron units is established by the Ministry's Experimental Plant for Resource Recovery, it is quite conceivable that values obtained by selling the product to the iron and steel industry will be higher than that obtained from the de-tinning industry.

It is necessary in order to exploit all markets, other than de-tinning, to densify the shredded ferrous fraction by either mechanically baling and/or nuggetizing the product. In developing these markets with demonstration lots from the Experimental Plant, this densifying service has been purchased from the private sector. The Halton Resource Recovery Plant, could have the option of buying the service or alternately,

installing the equipment as part of the plant, so as to have complete control over its ability to market the product. With the market development work being done by the Ministry to es-. tablish the credibility of the product as a source of graded steel scrap, it is possible the secondary recycling industry will develop appropriate equipment to handle in consort with resource recovery plants, all MFS produced from these plants. Industry forecasts of pending steel scrap shortages by the 1980's cannot be overlooked, and it is anticipated that MFS by that time will be an accepted product on the market place.

INTERACTION WITH THE MINISTRY'S EXPERIMENTAL PLANT FOR RESOURCE RECOVERY

The proposed Resource Recovery Plant for the Regional Municipality of Halton can expect to benefit in both a technological and marketing sense from the Ministry's Experimental Plant for Resource Recovery, which should be in operation by early 1978.

Separated commodities from this full scale research facility will be evaluated on the market place through demonstration tests in order to develop optimum product specifications as well as potential market prices. These markets and values can be directly related to those equivalent commodities that would be separated at the Halton Resource Recovery Plant. Overall revenue potential for the Halton Plant can then be assessed as well as the action to be taken to obtain firm commitments from potential users of the products.

Ministry Sales Contracts negotiated with Canada Cement Lafarge for the RDF demonstration study at their plant in Woodstock, commencing in late 1977, should not only clarify marketing and pricing policy of such a product, but also the economic acceptability of RDF as an alternative fuel.

Similarly, contracts for the sale of ferrous scrap conforming to user specifications will also demonstrate to the proponents of resource recovery plants the scope of such contractual arrangements within which a plant in Halton may expect to negotiate.

Revenues

It should be stressed that the market development efforts, identification, commitments, and contractual arrangements for the Halton Resource Recovery facility would all be underway during the preliminary hearings and pre-engineering studies required for such a plant. Contractual agreements would likely be finalized during the detailed design and plant construction thus providing an established projected revenue base prior to the actual startup of the plant.

Projected net revenue for the Resource Recovery Plant is based then on the sale of these two products (RDF and ferrous) as well as the sale of the estimated recoverable amounts of clean, unprocessed waste news and corrugated cardboard.

The value placed on these commodities is based on the current market prices and the projected prices in 1985,

based on the historical price practice of such products as well as the economic forecasting of raw material usage by the industry as a whole.

The net value in this case is based on the net selling price of the recovered product after removing the estimated freight costs to the user plant. It must be emphasized that all references to net revenue exclude plant amortization and operating costs.

Table IX summarizes projected revenues from a 'front-end' resource recovery plant.

CONCLUSIONS

1. There are two products that can be recovered in the 'front-end' of a resource recovery plant: shredded air classified mixed paper (RDF as an energy source), and ferrous (as a source of tin and/or iron units).

2. Although products such as clean used news and corrugated cardboard should be recovered prior to processing in a resource recovery plant, the amounts that might become available from the Municipality, other than that gleaned from the processable waste, can only be based on past community experiences. However, conservative estimates of recovery are based on the premise that impetus to source separation of the two materials

TABLE IX: REVENUES FROM A 'FRONT-END' RESOURCE RECOVERY PLANT

Year	Processable waste ton/year	RDF * ton/year	Ferrous Scrap ton/year	Corrugated and Waste News	TOTAL NET REVENUE Annual $	$/ton of Solid Waste
1977	125 000	62 500	6 250	8 750	757 500	6.00
1980	168 354	84 000	8 418	11 250	1 400 000	8.30
1985	210 597	105 250	10 530	15 260	2 520 000	12.00
1990	265 822	129 000	13 291	17 500	4 580 000	17.20

* Assuming that RDF (energy source) will be the only use for the air classified mixed paper fraction.

should be accelerated because of the presence of a central resource recovery plant.

3. Markets for the two marketable products (RDF and ferrous) are being investigated at this date (1977) and by 1985, should be established as economically viable outlets. RDF can be supplied to the cement industry as an energy source, while the ferrous material will have several outlets, including the de-tinning industry as a source of tin, and the iron/steel foundries and mini mills, respectively, as a source of iron units.

4. Net revenue from the sale of these two marketable products (RDF and ferrous) as well as that estimated from the sale of the projected amounts of waste news and corrugated, is estimated to yield, by 1985, $12.00/ton of processable waste.

REFERENCES

1. Communication; W. E. McCreary, Assistant to the Clerk, Regional Municipality of Halton, to the Minister of the Environment, the Honourable G. A. Kerr; Sept. 30, 1976.

2. Dillon, M.M. Ltd., "Resource Recovery Study, Regional Municipality of Halton", Ontario Ministry of the Environment, Project No. 9-5-004, May, 1976.

3. Communication; Minister of the Environment, the Honourable G. A. Kerr, to W. E. McCreary, Assistant to the Clerk, Regional Municipality of Halton, October 6, 1976.

4. Chantland, A.E., and Frank, H., "Ames, Iowa Opens Recovery System", Waste Age, October, 1975.

5. McKewen, T.D., "Maryland Resource Recovery Facility", Waste Age, September, 1976.

6. Dillon, M. M. Ltd., Op. Cit., Table 4.

7. Ontario Research Foundation, "Energy Analysis of Resource Recovery Options", Ontario Ministry of the Environment, April, 1976.

8. Ontario Hydro Statistical Information Centre, Toronto.

9. Hogan, Father, "Purchased Ferrous Scrap, U.S. Demand and Supply", Industrial Economic Research Institute, Fordham University, New York, June, 1977.

10. American Metal Market, June 16, 1977.

11. American Metal Market, March 22, 1977

12. Donnan, J. A., "Paper Recycling in Ontario", Ontario Ministry of the Environment, August, 1976,

APPENDICES

APPENDIX A: HALTON AND VICINITY ENERGY OVERVIEW (RDF MARKETS)

1980 RDF Production: 336 ton/day, 84,000 ton/year

Company	Energy Requirements BTU/day	RDF Equivalent* Required ton/day	Percent of RDF Used - 20% substitution rate	Comments
St. Lawrence Cement Co., CLARKSON	1 kiln at 11 200 x 10^6 2 kilns at 11 200 x 10^6 Total: 22 400 x 10^6 oil, gas, and coal	2778	15% substitution rate utilizes all available RDF	12% substitution rate by three kilns will utilize all RDF. Interest in using RDF, energy use high.
Domtar, Clay Products, COOKSVILLE	Haydite - 1500 x 10^6 Brick - 786 x 10^6 gas	200 104	11 5	Company proposing new rotary kiln.
Ford Canada, Steam Plant, OAKVILLE	4600 x 10^6 oil	662	27	Cyclic demand for steam (Appendix B) a disadvantage although demand is high; some corporate interest, but only on long-term.
Canada Brick BURLINGTON STREETSVILLE	 920 x 10^6 1314 x 10^6	 123 175	 5½ 8	A possibility for RDF usage in two ways: a) as a brick mixture ingredient to provide texture and BTU value, b) as a supplement to gas in firing tunnel kilns. Extensive modifications needed for tunnel firing. Development work will be done as brick ingredient during 1977-78. Good access and interest in conserving energy.

* Production over 250-day year.

..... 2/

APPENDIX A: HALTON AND VICINITY ENERGY OVERVIEW (RDF MARKETS) - continued

Company	Energy Requirements BTU/day	RDF Equivalent Required ton/day	Percent of RDF Used - 20% substitution rate	Comments
Abitibi Fine Papers GEORGETOWN	120×10^6 oil, and gas	16	Less than 1 percent	Low energy consumption; may not be long-term
John Drury School MILTON	247×10^6 gas	30	Under 2 percent	Although there is an interest in energy conservation, steam demand cyclic and low; low priority in RDF usage.
National Sewer Co. CLARKSON	780×10^6 - gas 10×10^6 - oil	105	5	An interest in energy conservation; 11 tunnel kilns; difficult to adapt to RDF; long-term possibility.
Monsanto Chemicals OAKVILLE	435.6×10^6 oil	60	12½	Poor access; low priority for RDF.
Canada Packers Beardmore Division, ACTON	not available	-	-	Low priority, poor location; small user of steam.
Ferro-Industrial OAKVILLE	not available	-	-	Steam plant, incineration; an interest in RDF potential, access only fair.
F.W. Fearman BURLINGTON	300×10^6 gas, and oil	40	Under 2 percent	Some interest; have new boilers; good access; low priority
Hercules BURLINGTON	480×10^6 oil	63	Under 2 percent	No interest; poor access.

..... 3/

APPENDIX A: HALTON AND VICINITY ENERGY OVERVIEW (RDF MARKETS) - continued

Company	Energy Requirements BTU/day	RDF Equivalent Required ton/day	Percent of RDF Used - 20% substitution rate	Comments
St. Lawrence Starch PORT CREDIT	not available	-	-	Poor location; not a likely user.
Steel Co. of Canada HAMILTON	28 800 x 10^6 oil, and gas	4200	Double available RDF	Stelco uses excess B.F. gas; waste heat, etc; cannot accommodate RDF.
Shell Oil OAKVILLE	6300 x 10^6 gas, and oil	900	38	Uses excess fuel, gas, waste heat; cannot accommodate RDF.
BP Canada OAKVILLE	not available	-	-	Similar to Shell
American Motors BRAMPTON	direct gas heating	-	-	No applicability for RDF
Wood Specialties OAKVILLE	192 x 10^6 waste wood	25	Under 2 percent	Although interested in RDF, all steam produced from internal wood wastes; access poor.
Westroc Industries CLARKSON	direct electric heating	-	-	Some interest; for future consideration; location good.

..... 4/

APPENDIX A: HALTON AND VICINITY ENERGY OVERVIEW (RDF MARKETS) - continued

Company	Energy Requirements BTU/day	RDF Equivalent Required ton/day	Percent of RDF Used - 20% substitution rate	Comments
Brant Hospital BURLINGTON	880×10^6	130	5	Low priority; poor location; excessive modifications to boilers.
Georgetown Hospital GEORGETOWN	400×10^6	57	2½	Low priority; poor location; excessive modifications to boilers.
Oakville Hospital OAKVILLE	480×10^6	70	2 3/4	Low priority; poor location; excessive modifications to boilers.

APPENDIX B: FORD MOTOR COMPANY TYPICAL STEAM PLANT DATA

1980 RDF Availability: 336 ton/day, 3360 x 10^6 BTU/day

Month	Oil Consumption gal	Steam Produced lb	Variation lb steam/hr	Daily Energy Requirement	RDF Required for 20% Substitution Rate - ton/day
January	1 300 151	212 378 800	135 000 - 452 000	7500 x 10^6	150
February	1 184 941	193 143 700	201 000 - 446 000	7750 x 10^6	185
March	997 975	156 063 840	110 000 - 401 000	5825 x 10^6	117
April	710 174	109 471 800	78 000 - 294 000	4215 x 10^6	84
May	665 540	101 371 960	70 000 - 243 000	3900 x 10^6	78
June	384 568	61 294 800	56 000 - 132 000	2260 x 10^6	45
July	308 502	48 913 800	44 000 - 114 000	1800 x 10^6	36

..... 2/

APPENDIX B: FORD MOTOR COMPANY TYPICAL STEAM PLANT DATA - continued

Month	Oil Consumption gal	Steam Produced lb	Variation lb steam/hr	Daily Energy Requirement BTU	RDF Required for 20% substitution rate - ton/day
August	362 546	58 603 600	50 000 - 115 000	2000×10^6	40
September	511 269	81 344 400	54 000 - 262 000	3050×10^6	61
October	821 633	99 135 600	82 000 - 282 000	4800×10^6	96
November	983 009	152 595 040	105 000 - 372 000	5850×10^6	117
December	1 013 027	153 361 170	120 000 - 360 000	5800×10^6	117

APPENDIX C

"OFFICIAL BOARD MARKETS" WASTE PAPER PRICES

(Buffalo, N.Y. Prices)

Year	#1 News Average Low	High	Corrugated Average Low	High
1965	$16	$25	$21	$25
1966	18	21	19	23
1967	14	20	15	18
1968	21	28	17	26
1969	19	23	24	27
1970	17	26	15	25
1971	15	23	14	20
1972	20	25	20	25
1973	15	27	25	35
1974	5	42	10	50
1975	2	25	5	15
1976	25	35	20	35

APPENDIX D

PRICE RANGE FOR STEEL SCRAP

#1 Bundles - Hamilton, Ontario ($/net ton)

Year	Average	Range
1965	$30.00	$28.50-32.00
1966	26.50	28.50-18.50
1967	25.00	24.00-25.50
1968	22.20	18.50-24.50
1969	23.50	18.50-28.50 (exports large)
1970	32.50	28.00-38.00
1971	25.00	21.00-32.00
1972	29.00	21.00-33.00
1973	42.80	36.00-53.00
1974	75.00	53.00-88.00 (world-wide escalations)
1975	54.50	40.00-67.00
1976	45.66	35.00-67.00
1977 (to June)	40.00	30.00-45.00

SOURCE: Iron Age

E X H I B I T S

ST. LAWRENCE CEMENT CO.

2391 LAKESHORE RD. W. MISSISSAUGA, ONT. CANADA L5J 1K1 TEL. 416-822-1653

March 29, 1977

Mr. P. J. Provias, P. Eng.
Ministry of the Environment
Ontario Centre for Resource Recovery
4375 Chesswood Drive
Toronto, Ontario M3J 2C2

Dear Mr. Provias:

Our Company has always been very active in energy conservation programmes and shall continue to do so. Already we are using various wastes either as fuels or raw materials in our process.

We are definitely interested in using "Refuse, Derived Fuel" providing it can be burned economically and does not generate problems with quality of product and pollution.

As you know, there is a test being run at Woodstock. We shall follow up on it very closely and make our decision as soon as results are available.

Yours very truly,

G. Zulauf
Vice President Operations

Z/mt

cc: LK

Ford Motor Company of Canada, Limited

The Canadian Road
Oakville, Ontario

March 9, 1977

Ministry of the Environment
Ontario Centre for Resource Recovery
4375 Chesswood Drive
TORONTO, Ontario M3J 2C2

attn: P. Provais, P. Eng.

USE OF REFUSE DERIVED FUEL
OAKVILLE ASSEMBLY OPERATIONS

Further to our meeting of March 9th, this is to confirm our agreement to the use of our monthly steam volumes as provided by Mr. Jones of OAP in your report to the Ministry and Halton Region.

We would request that the figures be indicated as a typical yearly pattern rather than identified as any particular year.

We appreciated the opportunity to review the draft of your report, as it applies to Ford of Canada, and aside from the correction regarding the boiler conversion program, we feel it represents fairly the results of our discussions.

Yours very truly,

KLRossi/aek

Forward Programs-Plant Engineering Office

c.c. G. L. MacKie
E. A. Russell

M&T
PRODUCTS OF CANADA LTD.
670 STRATHEARNE AVE N HAMILTON ONTARIO L8H 7N7 TELEPHONE (416) 547-1471 TORONTO (416) 922-4116 TELEX 061-8442 CABLE MANOT

RESOURCE RECOVERY
FEB 21 1977

February 15, 1977.

Ministry of the Environment,
Ontario Centre for Resource Recovery,
4375 Chesswood Road,
Toronto, Ontario, M3J 2C2.

Attention: Mr. Peter J. Provias,
Market Development Engineer.

Dear Peter:

This letter is to reaffirm our interest in obtaining the ferrous scrap fraction from any Resource Recovery plants which may be considered for the Halton or Peel Regions.

M&T have been in the metal recovery business for many years and are well aware of the various markets for scrap of this type, whether processed or unprocessed. From our Hamilton location we are ideally placed to receive ferrous scrap from Halton or Peel. Being the only Detinning Plant in Canada, we feel we are in a position to upgrade this scrap to its highest value, while obtaining additional value from the tin contained. This upgrading gives us quality end products which are always assured of a market in spite of the surges in scrap supply, demand and price, which we have all seen in recent years. These surges in market price encourage speculators, who will bid aggressively when the markets are high, but are unwilling to be tied down to a long-term contract where they are committed to take and pay for material.

When you are ready to receive quotations, we can bid on a fixed price basis, or a percentage of the scrap market with a floor price, F.O.B. your plant, or delivered as you require.

Thank you for your cooperation.

Yours truly,

E D Rogers

E. D. Rogers,
Manager of Recycling.

EDR/deg

TD
794.5
.P75
1977

Market analysis : proposed
resource recovery plant
regional municipality of Halton /
Provias, P. J.

76778